Technical Supplement—Gratis with "Architecture."

ARCHITECTURE SUPPLEMENT

DECEMBER, 1897.

Architecture Supplement.

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"Architecture" Calendar.

DECEMBER.

2.—Festival Dinner of the Royal Institute of British Architects, at the Whitehall Rooms.

3.—A. A., Mr. J. Osborne Smith, F.R.I.B.A., on "The Planning of High Schools and Endowed Schools for Girls."

6.—Liverpool A. S., Mr. J. A. Gotch, F.R.I.B.A., on "The Domestic Architecture of the Renaissance."

10.—Birmingham A. A., Mr. Beresford Pite, F.R.I.B.A., on "The Architecture of Michael Angelo."

13.—R.I.B.A., Reports on the Third Series of Brickwork Tests by Members of the Science Standing Committee.

13.—Leeds and Yorkshire Architectural Society, Mr. S. D. Kitson, M.A., on "Some Byzantine Churches in Greece."

14.—Sheffield Society of Architects and Surveyors, Mr. Frederic R. Farrow, F.R.I.B.A., on "The Warming of Public Buildings."

15.—Northern A. A., Mr. W. S. Vaughan, C.E. and M.E., on "The Construction of Steel Girders and Columns."

17.—A. A., Mr. L. A. Shuffrey on "House Painting."

17.—Society of Architects, Discussion on "The Registration of Architects."

NOTES OF THE MONTH.

The late Sir Henry Doulton.

By the death of Sir Henry Doulton, on the 16th ult., South London has lost a respected benefactor and the world of English industry a thoroughly representative man. Born in 1820—ere the importance of sanitation was recognised and when a general artistic intelligence was unknown—Sir Henry did much to make possible the development of both. So recently as last month we gave an account of the architectural showroom at Lambeth and described the foundation of his great success, which culminated in the production of the famous Doulton wares and the beautiful results of the Burslem Works, so that a lengthened review would be mainly repetition. But mention must be made of the kindly feeling between those employed by Messrs. Doulton & Co. and the principals, which has always been a pleasing feature in the career of the firm, and we remember the occasion of Sir Henry's seventy-fifth birthday, two years ago, when more than 800 employés (representing 4,000 workers) met to do honour to their esteemed employer. It was then that he gave an address, full of interest in the present day of industrial disturbances, rightly declaring that "for true progress (in industry) harmony is essential, and it behoves us all in England to labour hand in hand, shoulder to shoulder, to maintain such harmony among ourselves that our trade and prosperity may not depart from our land." Certainly he maintained that condition of things in his great works—an exemplar in dealing with men as well as a great originator in methods of manufacture.

British Colours.

The refutation of the attack upon British-made colours in a recent Blue Book, which we published last month, has excited considerable interest, not only among makers of colours, but users of the same. All seem agreed that much of the competition which English manufacturers have experienced in the Colonies has been of an unfair character, while the want of a standard in the colour renders such statements as those of which we complained excessively liable to exaggeration. Among our correspondents is a leading firm which has samples of colours made by almost every colour maker in France, Belgium and Germany, and examination has proved that their strength is not greater than those made here. Competition, therefore, we are forced to believe, is only possible by reason of the causes into which we entered in the November Supplement.

Sculpture.

During the month Brighton has received a statue of the Queen—the Mayor's contribution to the Jubilee memorials—and when placed in the Victoria enclosures it is likely to attract considerable attention. The statue has been executed in Rovaccione marble by the Sculptured Marble Company, and is 9 feet high. It will be mounted on a pedestal (also in Rovaccione marble), 9 feet 6 inches in height, which will stand upon three steps of a darker Carrara marble, making an effective contrast. This Company has executed some very fine works in sculpture, and we have lately seen some splendid illustrations of the Bahia monument, in marble and bronze, 84 feet 6 inches high, as well as statues of leading statesmen and symbolical groups executed by the Company.

Protection from Fire.

The recent fire in a crowded part of London has again drawn attention to the necessity for the adoption of fire-resisting materials wherever possible. Careful and studied planning may be useful, as Mr. Sachs says, in averting danger to life at a fire, but for the protection of property something more is required; and if the British Fire Prevention Committee, which has been formed within the last few weeks, intends to prove a useful organisation, it will have to emphasise the necessity for the employment of fireproof materials, or, at least, those which arrest the progress of flame. Good party walls are useful, but we should like to see a fuller consideration given to the construction of floors and the coverings of walls and ceilings. Recognising the importance of the subject, we intend, in our next issue, to commence a series of articles on various proposals for the lessening of the dangers of a fire when once alight. These would be of value at any time, but when the public mind is so concerned as now, seems a very opportune moment to draw attention to what suggestions have already proved successful in their application.

Architecture Volumes.

With this number, Architecture completes its second volume, copies of which, splendidly bound and fully indexed, will shortly be ready. The exhaustive character of the work, with its comprehensive review of French Architecture, its authoritative chronicle of Wren's work in the Churches of the City of London, its splendid articles on the Cathedrals of Canterbury, Gloucester and Hereford, and numerous other important features, constitutes one of those monumental tomes that should have a place on every library bookshelf. With Volume I., only a few copies of which now remain, Volume II. will form a record of Architectural Art such as is not to be obtained in any other form.

THE ARRANGEMENT OF SAW-MILLS & WOOD-WORKING FACTORIES.

By M. Powis Bale, M.I.Mec.E., Assoc.I.C.E.,
Author of "Wood-Working Machinery," "Saw-mills," "Stone-working Machinery," "Handbook for Steam Users," &c.

II.

Motive Power :—

As regards motive power, if a constant supply can be obtained water is, of course, the cheapest. Gas is useful for small powers, but steam is the one most generally employed. As regards the best type of engine for the severe duties of a Saw-mill much has been written. The writer is in favour of a long-stroke engine—say, double the diameter of the cylinder. This can be fitted with automatic expansion gear, a condenser, or be compounded as circumstances dictate. The best type of boiler, too, is open to much discussion, but space forbids. The writer has found both the Lancashire and water-tube answer well under varying conditions. The engine and boiler room should be entirely separated from the mill, and if a long line of shafting be employed, the engine should be arranged to transmit in the centre of the shaft if possible. Belt driving is generally to be preferred; the belt should be of a good length, and the pulley receiving the power should be well supported on either side.

Shafting and Gearing :—

Although a most important factor in the economical working of factories, till recent years comparatively little attention has been given to the design and arrangement of the shafting and gearing which transmit the power from the motor to the machines. Consequently much power which might have been turned to useful effect has simply been wasted in turning the shafting round and overcoming the undue working friction arising from the use of clumsy, badly-proportioned and ill-supported shafting, heavy pulleys, clumsy couplings, &c. However, this state of things is now rapidly giving way to an improved order of mechanism, and the following may be given as some of the points to be desired in shafting and its accessories.

1. Shafting Material.—Sound steel, accurately turned to standard gauge, straightened and polished.

2. Couplings.—To be simple, strong, readily uncoupled and carefully fitted, turned and balanced.

3. Collars.—Should be turned, bored to gauge, and faced and fitted with non-projecting set-screws.

4. Bearings.—Should be of a length and material to withstand, without undue wear and friction, the working pressure to which they are to be subjected. They should be pivoted and adjusted horizontally and vertically, so that they may automatically adjust themselves to any deflection in the shaft caused by belt-strain, &c., and so receive an equal pressure over the whole surface of the bearing, and at the same time permit of a ready alignment of the shaft.

5. Hangers.— Standards, brackets, plummer-blocks, &c., should be carefully designed and proportioned so as to give the greatest amount of strength where it is required without an undue weight of metal. All bases to be planed.

6. Pulleys.—Should combine, as far as possible, lightness with strength, be perfectly balanced, and be bored and turned perfectly true in a lathe, whether made of wrought or cast iron, and they should be easy to fix.

7. Toothed Gearing.—Gearing should in all cases be carefully designed and constructed for the particular work it has to do, and should be of as light construction as is compatible with absolute safety. For severe duty and heavy pressures, steel gearing is to be preferred.

8. Striking Gear.—Should be fitted where fast and loose pulleys are employed, and where the velocity exceeds 1,000 revolutions per minute in heavy machines, special means should be taken to pass the belt on the fast pulley very gradually, to lessen the shock to the shaft, belt and bearings.

9. Clutches.—These should be without complication in their construction, be certain in action, with no end-thrust, and be economical in wear.

10. Belts.—The proportion of these should be carefully calculated, so that they be of a size to readily transmit the power required without undue strain on belt or bearings.

11. Lubrication.—This must be efficient, and the nature of the lubricant adapted to the speed of the shaft and the size of and pressure on the bearings.

In recent practice it is the custom to lessen somewhat the diameter of the shafting employed, and to support it at more frequent intervals by bearings, and to substitute wrought-iron pulleys for cast, thus further reducing the weight. The economical importance of this will be recognised when we state that it takes about 1 h.p. to simply turn round every ton of shafting used.

As regards the best speed for Saw-mill shafting, after a lengthened experience, the author is in favour of a speed of 250 revolutions per minute for the first main shaft and 300 revolutions for the second, should there be one for the lighter machines. We are aware that these speeds are somewhat higher than those employed in some of the older mills, but they possess the great advantage of reducing the size and weight of the pulleys necessary to get up the proper speeds on the machines, and, in many cases, do away with counter-shafts, and so save power and belts, as well as reducing the first cost.

Driving Belts.—For high speeds and the severe duty of a Saw-mill a thoroughly sound leather belt is to be preferred to any other material. The leather should be of close grain, uniform in thickness, pliable, evenly jointed and of sufficient width and strength to transmit the required power without undue strain. Tolerably long belts are much preferable to short ones, but they must not be too long so that they "sag" unduly in working, or both they and the bearing of the machine will suffer. Short driving centres should be avoided, also crossed belts, or belts running in a vertical line. Do not run double belts over small pulleys; if more driving power be required, increase the width of the belt, if below 9 in., instead of its thickness. Where it is absolutely imperative to drive at short centres, leather link-chain belting can be recommended, and if over pulleys of small diameter, it can be shaped to the round on the pulley with advantage. Belts should not drive from very large to very small pulleys, say, not above 3 to 1, and should not run faster than 30 ft. per second. As regards joining belts, a double laced joint, with the holes punched and "staggered," and with only one strand in each hole, can be recommended.

Speeds of wood-working machinery in feet or revolutions per minute (approx.) :—

	At the periphery.
Circ. Saw for ripping soft wood,	9,000 ft. p. min.
" " " hard	6,800 ft. "
" " X-cutting soft	10,000 ft. "
" " " hard	7,500 ft. "

Mill or Reciprocating Saws designed to carry not more than one saw per 1 in. of width of saw or swing-frame :

	sq. ft.	ins.	
To cut logs up to	4	0 ... 110	revs. per min.
" "	3	6 ... 120	" "
" "	3	0 ... 125	" "
" "	2	6 ... 135	" "
" "	2	0 ... 155	" "
" "	1	6 ... 180	" "

Double Equilibrium Deal Sawing Frame (balance swing frames) :

	inches		per minute.
To cut two deals up to	14 × 5	...	300 revs.
" "	18 × 6	...	260 "
" "	24 × 7	...	220 "

Single Deal Sawing Frames :

To cut one deal up to	11 × 3	...	260 "
" "	14 × 4	...	250 "
" "	18 × 6	...	215 "

If these machines are well built and made these speeds may be increased 10 per cent.

Single Bladed Frames, 1,500 ft. to 2,000 ft. per minute.

The first part of this article appeared in last month's Supplement, and was concerned with the arrangement of the saw-mill, the arrangement of the machinery, machine foundations and the manipulation of timber—points of value to all interested in the wood-working industries.

BUSINESS CHANGES.

Partnership Changes.

Mr. Francis W. Bedford, 12 East Parade, Leeds, and 8 Princes Street, Westminster, has taken Mr. Sydney D. Kitson, M.A., into partnership, and the practice will be continued at both addresses under the style of Bedford & Kitson.

Marshall & Turner, Architects and Surveyors, of King Street, Nottingham, have dissolved partnership. The business will be continued by Mr. Arthur Marshall, A.R.I.B.A., at the same address as heretofore.

As already announced there has been a change in the firm of W. H. Saunders & Co., contractors, Poole Road, Bournemouth. Mr. S. W. S. Saunders continues in his own name.

Temporary Offices.

In consequence of the rebuilding of their offices at Belvedere Road, Lambeth, S.E., Messrs. Eastwood & Co., Ltd., have taken temporary offices at 61, Temple Chambers, Temple Avenue, Victoria Embankment.

New Branch.

The General Electric Company, Limited, have opened a new branch at 9, William Street, Dublin, with Mr. Fletcher, who was for some years in the company's London house, as manager.

Limited Liability Company.

The business of Messrs. Ashwell & Nesbit, warming and ventilating engineers, has been converted into a Limited Company, under the style of Ashwell & Nesbit, Limited, with offices at 12, Great James Street, Bedford Row, W.C., and works at the Victoria Foundry, Leicester.

New Showrooms.

A London office and sample room, at Bartlett's Buildings, Holborn, E.C., has been opened by Messrs. W. Godwin & Son, encaustic, enamelled and art tile manufacturers, Lugwardine Works, Withington, near Hereford.

The Imperial Stone Company, Limited, of East Greenwich, have taken City offices and showrooms at 4 & 5, Aldgate, E.C.

MUSEUM

CEMENT SLATES

Export Business.

THE cement trade has had a very good season, and export business has been particularly brisk, thanks to the increased consumption of Brazil and our possessions in South Africa. For the ten months ended 31st October, the total exports were 338,386 tons, valued at £557,509, as compared with £501,515 in 1896, and £544,624 in the previous year. The Dutch market is fairly steady, but the shipments to the United States are only a few pounds above half their value in 1895, when they amounted to £194,093 for the first ten months. Brazil's 20,314 tons are more than the exports for the years 1895 and 1896 totalled together, and, although the Argentine Republic has taken 5,000 tons less than in the corresponding period of last year, the total quantity (19,223 tons) is twice that of 1895. Australasia has taken more than previously, but is 12,000 tons behind the returns of two years ago, while the manufacturing capacity of Canada is probably responsible for the comparatively small value (£18,691) of the ten months' shipments thence.

Competition in the Colonies.

So far as some of our Colonies are concerned, there seems an impression that German cement is gaining ground, and, in the recent Blue Book on Colonial trade, it is declared that, excluding contracts for public works, the greater part now being imported into Victoria is German. It is not so good as the British as regards strength and general quality, but, being finely ground by steel rollers, is said to be of a better manufacture, while the cheaper price is also a consideration. Queensland also imports large quantities of German cement, because of its cheapness, while other causes are assigned for the popularity of German cement in South Australia. This is due, we are told, to the fact that, in specifications for the supply of the cement required for large Government works, a degree of fineness of grinding was stipulated, which British makers were then disinclined to produce. But the Germans were alert to the necessity of complying with Colonial requirements, and, having obtained a position, have since made every effort to retain the advantage.

Rugby Portland Cement.

WE have to acknowledge the receipt of a Calendar for 1898 from the Rugby Portland Cement Company, which shall have a permanent place on our office walls. Apart from its high artistic merit, it presents a useful summary of the various operations necessary in the manufacture of cement, and illustrates the extent of the works at Rugby. At that town the deposits of limestones and marls are admirably adapted for making cement, and since 1872 they have been carefully utilised in its manufacture. The stone is quarried in the immediate neighbourhood, and, having been crushed, is ground to powder. Then it is mixed with water, first in horizontal boxes and again in vertical pug mills, and made into bricks, dried and taken to the kilns. The operations of crushing and grinding are again performed ere it is passed through fine sieves. Here every care is taken to ensure that degree of fineness so essential in good cement, while the previous watchful mixture of the materials contributes to a high standard of quality. Consequently, this particular brand is possessed of great strength, and its powers of carrying large proportions of aggregate are great indeed. The daily breaking tests for the month of August shew an average of 519 lbs. to the square inch at an age of 7 days, and of 706 lbs. at the age of 28 days. During September these figures were 544 and 731 respectively, and we have seen a test of an artificial stone in which Rugby Portland cement was employed which gave a crushing weight of 9394 lbs. to the square inch.

Mr. I. Brooks.

AS a prominent member of the cement industry, Mr. I. Brooks well deserves a place on this page, and the accompanying photograph will be regarded with interest all over the country, where the good qualities of Rugby Portland cement are recognised and acknowledged.

MR. ISAAC BROOKS.

The career of Mr. Brooks may be said to have commenced in 1851, when he attached himself to the service of the Midland Railway Company at Broughton Astley. On the opening of the Mangotsfield to Bath branch of the line, he was transferred to the latter city, and then, on the expiration of a year's service at that place, became station-master at Rugby, where he has remained in various capacities ever since. He had had considerable experience of both goods and passenger traffic, developing each in a way that found favour with all concerned in the welfare of the Midland Railway. When he left Evesham, where he was stationed for a time before his Rugby appointment, Mr. Brooks was the recipient of a handsome scarf pin from the Duc d'Aumale, recently deceased.

After eighteen months at Rugby, he severed his connection with the railway, and became identified with the Rugby Portland Cement Co., having the option of returning to the service at any time within five years.

The energy and ability which he had demonstrated in his previous capacity enabled him to organise the commercial operations of the cement company with the greatest possible success. During the past quarter of a century he has had entire management of the commercial side of the business, as well as a large portion of the indoor management, and that the great development of the concern was mainly owing to his enterprise was recognised by the proprietors (Messrs. Henry Edyneau-Walker & A. C. Walker) quite recently, when, on the demise of Mr. Charles Hall, they offered him the managership.

This he accepted with all the good wishes of his large circle of private and business friends, and there is no doubt that, as long as Mr. Brooks is associated with the concern, its progress will be continual and sound.

The Slate Trade.

ALTHOUGH Lord Penrhyn's quarries are now fully at work, the importation of American slates has not ceased entirely, but it has shrunk to such an extent that we believe a very small concession in the price of Welsh slates would extinguish what profit is now obtained on the importation of foreign slates. At the same time, it must not be forgotten that the demand keeps well up to the supply, if it does not exceed it, and that the deficiency (70,000 or 80,000 tons out of a Welsh product of 500,000 tons) caused by the Bethesda dispute cannot be made up in a short time by the existing quarries. Then, too, the quantity of undeveloped slate rock is now becoming very small indeed, and that which exists cannot be brought into play for three or four years at least. Under these circumstances, the Welsh quarry owners need not be surprised at the continuance of a small trade in the American article; although, as we said last month, with the promised trade revival, the States will keep all the best brands across the Atlantic, and those of lower quality will not pay to export now that our own quarries are at work.

On the East Coast.

FROM Hull we have received the following report on the state of trade in that district:—"For some time past the merchants and slaters have been fully taxed to secure adequate supplies in almost every quality of Welsh slates; especially has this been the case in regard to Dinorwic slates, which are very popular with the architects here. Merchants' stocks were exhausted months ago, and these have not been replenished to any appreciable extent, owing to the excessive demand upon the quarries, who are still overbooked. There are a fair number of buildings still in course of erection, and the outlook for the master slaters and merchants is very promising for the winter months. At the present time all are fully occupied, and, from the number of contracts booked, there is not likely to be any lull in the trade before early spring of next year. In odd instances delays have occurred, but there has not been any serious stoppage for want of supplies; at the same time, architects have had to modify their specifications somewhat to meet the exigencies of the case." This report receives endorsement from other towns along the East Coast.

KETTON FREESTONE.—As agents for Major Braithwaite, Messrs. Woodforde and Wing, of Stamford, have erected steam power in Edithweston parish, which adjoins Ketton, and are now prepared to supply Ketton freestone, identical in quality with the finest stone, as the quarries are only divided from the famous old Ketton stone pits by a fence.

BELFAST is to have a new City Hall, the erection of which will cost £154,864. Messrs. H. & J. Martin, Ltd., are the contractors and Messrs. E. Thomas & Son, 7 Queen Anne's Gate, Westminster, the Architects.

BRICKS TILES

Godwin's Tiles.

Not only have encaustic tiles provided an effective covering for floors and walls, but they have been introduced into fireplaces and hearths with advantage. We illustrate a new chimney-piece, designed by Messrs. William Godwin & Son (who have done good work in reproducing mediæval patterns in their entirety), and the tiles being extremely hard and durable, as well as the colours being clear and distinct, should convince architects of the permanent and brightening effects of encaustic tiles when so used. The whole of the hearth is composed of tiles, there being a patent tile fender to complete the design and add materially to the effect of the *ensemble*.

CHIMNEY-PIECE BY WM. GODWIN & SON

Of course, considerable pains have been taken to prevent the panels warping and the tiles being forced out of position by the uneven contraction of cement, &c., and Messrs. Godwin & Son have adopted a patented method of slabbing, by which tiles or slates of a hard material are embedded on the back of the cement, thus affording a counteracting influence to the shrinking of the cement and equalising the contraction on both front and back of the cement slabbing. It is also claimed that this system strengthens the panel, because the tiles that are embedded in the cement backing are placed in break-joint positions, arranged crosswise longitudinally. Architects using slabbed panels are, therefore, advised to consider the merits of the plan, which seems to be conceived on right lines.

This business was founded by Mr. William Godwin, at the Lugwardine Works, Withington, near Hereford, in 1848, and in several of our leading Cathedrals examples of his truly artistic work may be seen. Not only has he copied many of the richest patterns that remain to tell us of the Art of the mediæval ages, but he has contrived to give an impression of the antique on the surface, which results in most pleasing effects. The late Sir Gilbert Scott had a high opinion, not only of the artistic quality of these tiles, but also of their excellent manufacture, and scores of other leading architects have endorsed his views.

The fame of these tile-makers is not only associated with many beautiful works in this country, but they have been responsible for some very fine work abroad. The Chancel of the Cathedral at Colombo was paved with mosaic work by this firm, and when recently visiting Hereford we went to Withington, where we saw their packing rooms crowded with enormous cases for shipment to the Cape, South America and elsewhere. Another sign of the expansion of their business is to be seen in the opening of new showrooms and offices at 15, Bartlett's Buildings, Holborn Circus, E.C.

Laundry Machinery. — The Metropolitan Asylums Board have accepted the tender of Messrs. D. & J. Tullis for the supply and fixing, at £3,072, of laundry machinery and fittings at the Grove Hospital. Thirteen other tenders were received, ranging from £3,189 to £4,595.

LIGHTING HEATING AND VENTILATION

DAYLIGHT BY NIGHT.

The "Holophane" Globe.

WITHIN the past two years an ingenious Frenchman, M. André Blondel, and an equally inventive Greek, M. Sp. Psarondaki, have been adding considerably to the illuminating capacity of many leading social institutions in the West End, among

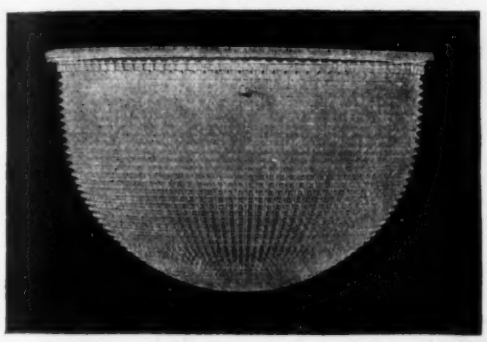

FIG 1.

which we can vouch for the Devonshire, Sports, Grosvenor, New Lyric, National Liberal and St. Stephen's clubs. Whether gas or electricity has been the illuminant, matters not to these two gentlemen ; the system of light diffusion which they have provided enhances the value of either, and, such being the case, deserves our attention. Illumination, with all the necessary accessories, is becoming so specialised that any plan of economising cost and increasing power which is applicable to any method of lighting should warrant consideration, especially when, as in the case of the "Holophane," success has attended its inauguration, and the favour of architects secured its adoption.

It was to obtain some authentic data concerning the new idea that our Special Commissioner called on Mr. S. M. Scott the other day. Mr. Scott is the managing director of "Holophane," Limited, and in the brilliantly-lighted showrooms at 91, 93 and 95, Queen Victoria Street, E.C., he was good enough to explain the principles of the system, and to demonstrate the veracity of the claims upon which it is basing its appeal for public appreciation. Our Commissioner writes :—

The managing director of "Holophane," Limited, has made a study of all that appertains to artificial lighting, and we were soon engaged in quite a scientific dialogue, in the course of which we rapidly got to the main feature of the "Holophane," which he described as follows :—

"We get the desired results from a globe which is equally luminous over its entire surface ; that destroys the violent glare of the intense source of light by perfect diffusion ; and that so effectively controls and directs the rays of light as to give an illumination that is even greater than the bare light."

And I was then shewn the globe illustrated in Fig. 1. This is of crystal moulded glass, and its interior surface is covered with carefully-calculated vertical ribbings that break up the light. On the outside are similarly calculated lenses or ribbings running horizontally and directing the rays in those directions where the greatest illumination is required. Upon this point Mr. Scott places much reliance.

"You see," he said, "by that means we are able to so concentrate and direct the light that no rays are wasted, and all are centred in the particular direction where the light is most needed. This important consideration has secured the adoption of the "Holophane" globe for such places as the Free Library at Hammersmith, several Churches, including no fewer than three in Rhyl, hotels of such size as the Manchester in Aldersgate Street, E.C., the Holborn Viaduct Hotel, and the Grand at Manchester, as well as the "Pegamoid" showroom in Poultry, E.C., where a hundred of our globes illustrate their advantages for special decorative effects. At Messrs. Maple & Co.'s showrooms, in the Tottenham Court Road, you will see another fine illustration."

"But what as to the actual results? It is clear that your globe does enhance the power of the light; but to what extent?"

"On such a point Professor Vivian Lewes has reported very favourably, and he told a meeting of the Incorporated Gas Institute that 'the "Holophane" globes, which give a perfect distribution and diffusion of the light, at the same time increase it very considerably for all angles below the horizontal, and marks a very important advance in domestic lighting,' while Dr. Drehschmidt, of Berlin, made experiments with incandescent gas burners which proved that, below the horizontal, our globe gives an average of 29 per cent. more light than the bare incandescent burner, and, at angles below 45°, 100 per cent. more than the bare light."

Illustrating these tests, I was given the diagram shewn in Fig. 2, a glance at which gives the comparison between the bare burner and that when the "Holophane" globe is used. It must be remembered, too, that the tendency of the bare burner is to emit rays in an outward and an upward direction, and of all ordinary globes to weaken the power of the light by absorption—which fact adds to the favour with which many architects are regarding this innovation. This loss of light is greater than many think, and the engineer to the Liverpool United Gas Light Company has estimated it to range from 10·57 per cent. in the case of clear glass to 73.98 per cent. when ground opal with painted figures is used.

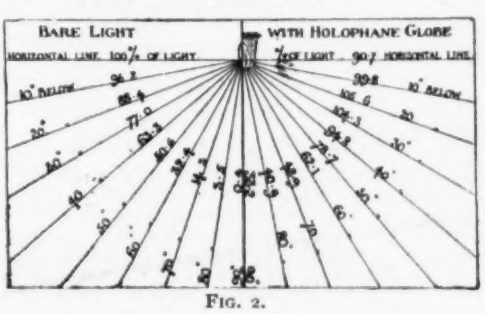

FIG. 2.

"While we increase the light, we also mellow the harsh centres and destroy the sharp shadows, and similarly good results are obtained in the case of oil lamps or electricity, a fact that is proved by the splendid demand now being made upon our producing capacity. Although the globes have only been on the market a little over a year, they have been adopted in many prominent positions with the best results."

So far we had talked of the "Holophane" only so far as interior illumination was concerned, and I asked Mr. Scott how it stood the exposure of the weather—a matter of much importance in these days of fierce competition between electricity and incandescent gas, as well as of the many lamps, globes, &c., now advancing their claims.

"Go to Munich and see for yourself," was the cheery reply. "There we have 5,000 in use in the principal streets, and those thoroughfares at night are like unto day—so effective is the light when compared with ordinary methods. You see the "Holophane" is universally applicable. It can be adapted to the more intricate schemes of interior ornamentation, and the plain and necessary business of street lighting, with success."

And having inspected the splendid variety of crystal and new patent rose tints in which the globes are made, I made my way into the street, where the glare of the electric lamps and of the gas lights contrasted strangely with the daylight effects which had been produced within by the agency of the "Holophane" globe.

New Catalogue.

IN splendid binding, worthy of the firm's reputation, comes a catalogue from Messrs. Evered & Co., Ltd., the well-known manufacturers of every description of fittings for gas and electric lighting—and of architectural metal work generally. This list is devoted to chandeliers, brackets, hall lamps and general gas fittings, and is carefully sectionised. Several pages are devoted to gas joints, and the makers point out that all the fittings are carefully tested before leaving the works. In brackets we notice some very artistic patterns, illustrated on a scale of about one-fourth of the full size, and in hall lanterns, billiard lights, gas rails, bar and window fittings, shop lights, gas pillars, shade lights, &c., some excellent reproductions have been made. In chandeliers there is a very pleasing selection, care having evidently been taken in the designs to ensure a really good effect without any over-burdening details. At the same time, there are several elaborate styles indicating that Messrs. Evered & Co. have every facility for the production of high-class work. Not only have they a wide range of their own designs in stock at their Drury Lane showrooms, but are willing to embody the ideas of architects in gas or electric lighting of every kind.

R.I.B.A. EXAMS.

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WOOD-BLOCK FLOORING.

The "Acme" System.

WHEN we consider the solidity of the floors now made of wood blocks with the unevenness which seemed to characterise them a couple of decades ago, a great advance in the method of fixing the blocks must be recognised. And, with the improvements made, the name of Mr. William Duffy deserves recognition, for that gentleman's persistent endeavours on behalf of wood-block flooring have been based upon sound ideas incorporated in well-seasoned wood. When he commenced his experiments there was much prejudice against wood blocks for flooring, owing to the looseness of the blocks, which frequently rose in the most unexpected places and led to several accidents. Even the old Emperor William of Germany was caused to stumble just before his fatal illness, owing to some badly laid wood blocks. Mr. Duffy, therefore, came to the conclusion that any new scheme must avoid the old loose joints, and produce a continuous floor practically in one piece.

Dovetailing he recognised was insufficient, as was also the embedding of the blocks in a mastic composition, and so he determined to adopt a special system of dowelling together the sides and ends of the flooring blocks by means of pegs or pins which, when the floor is being laid, enter and fit into corresponding holes in the sides and ends of the adjacent blocks. Along the bottom edges of the blocks are longitudinal V-shaped grooves which, when laid, receive the adhesive and preservative composition, thus giving an additional strength and ensuring the durability of the floor. The inventor of the system rightly points out that the floor thus made is quite solid—there are no grooves to allow of the accumulation of dirt, the dowels completely closing up every space.

Additional strength is provided by the use of bonding blocks embedded in the cement concrete which forms the foundation. To these the superposed flooring blocks, or briquettes, are thoroughly secured, thus affording an effectual provision and safeguard against the disruption or upheaval of the flooring. Thus, when the system is adopted in places where heating-pipes are used, it can be thoroughly relied upon to maintain its immovability.

In such a system as this much depends upon the nicety with which the dowels are adjusted to the holes, and, consequently, it is of interest to know that it is now being made by a Company whose facilities for the manufacture of the blocks are of the most modern character, viz., The Acme Wood Flooring Company, Limited, whose operations Mr. Duffy directs. We give a view of the front of their works in Gainsborough Road, Victoria Park, London, N.E., which at once strikes the bearer as of imposing proportions—and a visit to the premises not only confirms such a view, but increases the impression, for on either hand are extensive yards where large quantities of timber are stacked ready for use. The process of seasoning is most complete, and the machinery for cutting the oblong blocks, boring the necessary holes and making the dowels, is efficient to the highest degree. The works abut on the River Lea, thus increasing the facilities of the Acme Wood Flooring Company for the prompt execution and despatch of orders.

During a visit to the works we were convinced that wood-block flooring lends itself to some very agreeable combinations, the oblong shape of the blocks not only allowing a more effective "bond," but also enabling the work to be carried out in herring-bone and other patterns. The blocks can be had in oak, jarrah, karri, pine, maple, teak, and, in fact, in every marketable wood, so that excellent combinations of colour can be arranged to vary the monotony that might otherwise occur. At the Gaiety Buffet, in the Strand, for instance, is a floor of jarrah and oak laid on this principle in 1885, and, despite the stream of traffic ever since, it is as sound to-day as when laid twelve years ago.

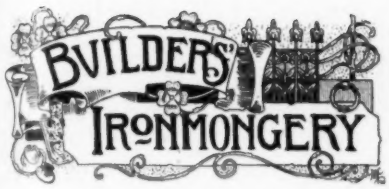
We have been favoured with a complete list of the works executed by the Company, and this comprises many of the most important buildings in the country, and the specifications of architects of the highest repute. In 1885 the first blocks were laid in a London Board School on this principle of dowelling, since when the system has given such entire satisfaction that it is now the only plan adopted by the Board, scores of whose schools testify to the strength of the floors thus laid. Assurance offices, designed by Sir A. Blomfield and Messrs. Aston Webb & J. McVicar Anderson, have utilised the "Acme" plan, as well as large public baths, barracks, clubs, drill halls, fire brigade stations, police courts, &c., while the list of banks (including the Bank of England), for which the company has provided floors run to the extent of a directory. Business premises innumerable are similarly "floored," to say nothing of churches designed by the late J. D. Sedding, Messrs. Pugin & Pugin, Mr. Leonard Stokes and others. Newnham College at Cambridge and Mansfield College at Oxford—both designed by Mr. Basil Champneys — have wood-block floors. The "Acme" system may also be seen in the Holborn Restaurant, as adopted by Mr. T. E. Colcutt, as well as in scores of theatres, including Her Majesty's Theatre in the Haymarket, London, designed by the late Mr. C. J. Phipps, and hundreds of private mansions and houses, among which the residences of the Duke of Norfolk, the Marquis of Bute, the Earl of Lonsdale, Lord Wantage and Sir W. Pearson, Bt., M.P., are notable.

VIEW OF THE ACME WOOD FLOORING COMPANY'S WORKS AT VICTORIA PARK, E.

SHIPPING MARKS ON TIMBER.—From the office of the *Timber Trades Journal* comes a copy of the only list of Shipping Marks on Deals, Battens, &c., published in this country. The work entailed in its compilation cannot be rightly estimated by a glance at its contents, although that is sufficient to convince anyone of its thoroughness. The marks on timber exported from Sweden, Norway, Finland, Russia, Germany and Canada, are all set forth in the English and French classifications, and we have been able to test the accuracy of a number of the entries without finding a single error. Its reliability is equal to its exhaustive character.

THE SOCIETY OF ARCHITECTS has elected Mr. Walter L. Emden, J.P., as President for 1897-98. Major F. Seymour Leslie and Mr. Silvanus Trevail, F.R.I.B.A., are the vice-presidents, with Mr. Ellis Marsland as hon. sec.

USEUM



DESPITE the pessimists, English makers of locks are able to hold their own with their foreign competitors, so far as strength, durability and serviceableness are concerned. For instance, Messrs. Hobbs, Hart & Co.—a firm that was established in the year of the Great Exhibition of 1851—have provided suites of locks, not only for many important castles, hotels, hospitals, prisons, asylums, &c., in England, but also for the Boston Museum of Fine Arts, the Parliament Houses at Cape Town and the Australian Museum at Sydney. We have been glancing at the General Lock Section of their catalogue, in which is set forth a very complete variety, notable among which are the protector locks, combining the principles of lever security as a protection against the use of any but the true key, of the moveable stump security as a protection against picking, and the revolving nozzle security as a protection against fraud. In addition to the comprehensive category of locks, the catalogue contains illustrations of a selection of presentation keys in gold, silver and aluminium, which have been manufactured by Messrs. Hobbs, Hart & Co., whose facilities for the execution of architects' special designs are of no mean order. Altogether, a perusal of the new catalogue enhances previous high opinions of this firm's work.

Opalite.

THE interior decoration of public places, such as hotels, cafés, restaurants, baths, &c., as well as such domestic offices as kitchens, lavatories, &c., has occasioned much worry and resulted in frequent disappointment. So few of the coverings for walls have proved satisfactory that we shall soon get to the end of the list of reliable materials we have decided to review in these columns. Of course Opalite is included in the number, for this is a sanitary material of such a polish that dirt will find a difficulty in adhering thereto. Being made in a variety of tints, excellent artistic effects can be obtained by its use, and it has the advantage of not losing any of its polished surface by exposure to damp, frost or heat. The reflecting power is of a high degree—a fact which renders it serviceable for the walls of subways and basements. Already Opalite has been applied to the walls of many important buildings, and Messrs. Beanland, Perkin & Co., of the Prudential Buildings, Leeds, are willing to supply more detailed information than our space permits us to give.

Furniture Catalogue.

PEOPLE in want of ideas as to the furnishing of rooms will find plenty of hints to be obtained from a glance round the showrooms of Messrs. Graham and Banks, of 445, Oxford Street, W.; or if they cannot pay a call a study of their splendid new catalogue will serve as a guide. Here we have some capital photographs of drawing-rooms in the Louis XIV., XV. and XVI. styles, and a striking example of an oak-panelled room with a tapestry frieze. Those who have followed the articles on French design in ARCHITECTURE will be interested in the fine collection of French furniture shewn by the firm whose principals personally attend to all special work. In addition to their business in artistic furniture, Messrs. Graham and Banks undertake decorative work and electric lighting as well as sanitary surveys. They have special facilities for parquet flooring, making this ornamental work a speciality. The catalogue calling forth these remarks is concluded with some effective designs in parqueterie.

MESSRS. ATKINSON & Co., of Westminster Bridge Road, S.W., have contracted to supply the glass window blinds and iron fire-guards required at the new Park Hospital for the Metropolitan Asylums Board.

ZINC ROOFING.

A SYSTEM of roofing that shall resist the action of the atmosphere, and be proof against all the elements that such exalted positions have to encounter, has ever been the aim of those who have studied the construction of houses. Unfortunately, in practically endeavouring to carry out such a desire, due attention has not always been paid to the purity of the materials used, with the result that discredit has been cast upon really good agents. Thus zinc which is not pure (when, for instance, it contains iron) will not resist the action of the air, but when perfectly pure and when applied in the form advocated by Messrs. Frederick Braby & Co., has proved itself an economical and satisfactory material. By allowing plenty of play in the laps, they are able to allow for the expansion and contraction of zinc—which, as is well known, is greater than in other metals—and so obtain a durable and substantial covering. In order to ensure the standard purity, Messrs. Braby & Co. have a special quality rolled for them, and this has been applied, according to the specifications of architects, at the Hotel Metropole and other notable buildings in London, as well as in such trying situations as the pier pavilions at Lowestoft, Brighton, Nice and St. Leonards, to say nothing of railway stations all over the country.

It is claimed for the firm's patent system of glazed roofing, with bars of zinc or copper, that it secures immunity from breakage owing to vibration or contraction and expansion, as the glass is laid free on an elastic cord and secured by a spring clip capping. No paint or putty is required, and the system can be easily fixed to new or old buildings.

From an excellent work which Messrs. Braby & Co. have issued on the subject of roofing, we learn something of their "Italian" corrugation—a method for obtaining a cheap, light and durable covering without requiring any boarding. The principals of the framing may be made much lighter than for any other covering, an important consideration in the case of large spans. In the book to which we have referred are several illustrations shewing how the system can be applied to railway stations, dock sheds, warehouses, etc. The firm's experience extends over a period of half-a-century, and in addition to half-a-dozen places in London they have branches in Liverpool, Glasgow and Adelaide.

BIRMINGHAM.—Mr. Edward Airey, of Gillott Road, Birmingham, is building a number of villa residences in the Woodbourne Road, Edgbaston, and Mr. S. Needle is remodelling a number of old houses at Knowle, about nine miles from the town. Some excellent ornamental woodwork has been done by Messrs. Parkers, Ltd. Mr. J. Statham Davis, of Sparkbrook, is the architect.

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FIRE-PROOF PLASTER.

IT is a marked characteristic of present-day architecture that, to the architect, there has come an increasing responsibility to study with minute care the materials he uses for the construction of buildings, both of a public and private character. Mere beauty of design and convenience, though frequently what is only sought after, is often of less consequence than endurance and safety.

In plastering, as is shewn by Mr. Millar's monumental work recently issued, great advances have been made. Plasters are now available which possess all the tenacity and enduring qualities of the old Roman cements, with enormous improvements as to handling and economy. Probably the latest, as it certainly is the most remarkable addition to our plasters, is that placed upon the market by the Asbestos and Asbestic Company. It is pleasant to chronicle the fact that this production hails from one of our Colonies—the colony which has of late shewn such a strong desire to reciprocate its nationality on commercial lines. The variety of asbestos, which is the main constituent of "Asbestic" plaster, comes from the province of Danville, in Lower Canada. The Danville Mines, near Quebec, appear to hold an inexhaustible supply of this fibrous material, and the Company having made remarkable progress in the Dominion, have now opened out in this country, where, with the assistance of the slowly-won and perhaps too conservative British architect, and builder, they mean to get to the front. That they deserve to get to the front, and that rapidly, a consideration of the article they supply will demonstrate even to the most obstinate stickler for older methods.

The plaster is composed of 80 per cent. pure asbestos and 20 per cent. serpentine. What is specially claimed, however, for "Asbestic" plaster, in addition to the qualities which belong to all workable plasters in ordinary use, is that the covering properties are 40 per cent. more than those of ordinary plaster; that there is no cracking and crumbling—the fibrous character of the asbestos giving even greater advantages in the way of toughness and tenacity than were obtained by the Greeks from the wonderful white hair they employed; that it is more adhesive, and, being a perfect natural filter, there can be no discolouration from flooding, &c.; that it is a non-conductor of sound and heat; that it is sanitary; that it is economical, being 40 per cent. lighter to handle, whilst mixing and application is so much easier that 25 per cent. of labour is saved; that it prevents corrosion of the iron and steel beams and columns; and, chief of all, that it is absolutely a fire-proof plaster.

In proof of all this, they quote such men as Mr. John Sutherland, a master plasterer of twenty years' experience, and the man who has done the work at the Houses of Parliament, Ottawa, under the direction of the Government architect, Mr. Ewart; and also of Messrs. Carran & Morrison, two of the largest contractors in New York. These men testify to the truth of the claims made, as a result of their actual experience, and they compare it with other plaster, and pronounce in its favour all along the line. We can testify ourselves to the most perfect surface produced; to its impenetrability as to sound and discolouring substances; to the ease with which it can be applied and handled, and to the fact that nails may be driven through it with the same ease as through a plank.

As to fire-resisting powers, these are inherent in most good plasters to some extent, but the ordinary plaster, whilst preventing flames from spreading for a time, eventually crumbles away, especially when water is poured on. Herein is the great triumph of the new plaster. Practical tests have been made which prove that, should fire break out in a room covered with this plaster, the fire can not only be confined to the room, but no damage will be done to the walls, ceiling or floors. It is intended to give public demonstrations of this shortly. Meantime, we extract the following particulars of a test made at Washington, from a Montreal contemporary:—

"A very interesting experiment with asbestos plaster took place in the northwest court of the U. S. Treasury Department building. Those present were Mr. Fouche, chief computer; Mr. Haymond, in charge of testing and experimental work; Mr. Adams, chief of the heating and ventilating department, and Chief Engineer Watts. In the court was placed a structure representing a miniature house, the roof of which was about four feet high, the interior being plastered with 'Asbestic.' Around the structure were piled kindling wood, shavings and paper enough to make a bonfire to celebrate a great political victory. After being ignited the light structure was immediately enveloped in flames which burned fiercely and furiously, but to no avail, as they had found a master. After being subjected to the fire for half-an-hour, an important test was made. A stream of water, through a one-and-a-half-inch noozle, was poured on the plaster attached to the sides and roof, without any effect. The plaster did not drop or crack, but was intact, demonstrating conclusively that it was fire-proof."

A similar trial was made at the Grand Opera House, Paris, in August last, in the presence of M. Renard, architect of the Opera; M. Bernier, architect of the Opera Comique; M. Debize, chief engineer of State Factories; Mr. Thomas, general manager Eiffel Tower and Musée Greven; M. Olive, architect; Mr. P. Boyer, architect; M. Decron, architect for the City of Paris; and M. Paul Boca and M. S. Chalvet for the Company. They placed the two partitions horizontally on staging, one was covered with plaster and the other with "Asbestic." Below, a fierce fire was lighted in a brazier, the flames from which rose above the sides of the partitions. After some time the partitions were withdrawn and placed on the ground. In withdrawing, the ordinary plaster on the first became detached and fell to pieces. The partitions covered with "Asbestic" remained intact. Both, while still very hot, had cold water thrown over them. The plaster crumbled to pieces. The "Asbestic" did not move. The walls of cork bricks covered in plaster and "Asbestic," placed vertically and subjected to fire at the sides in the same way, gave the same results.

In this country Sir Donald Smith's house at Glencoe, and Sir William Millar's house at Ascot, have both been plastered with the "Asbestic" plaster, and the architects and builders are all well satisfied with the results of the working, while at Olympia, which is being reconstructed to render it fireproof, "Asbestic" has been approved of by the London County Council, and all the iron screens and partitions in that great building will be covered with this material.

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Preserving the Houses of Parliament.

DAMP walls have ever been a cause for experiments more or less disappointing in their results, and so long as porous materials are employed for walls will the complaint of dampness be heard—unless they are scientifically treated. The water in the atmosphere not only penetrates such material, but frequently conveys chemical agents, which hasten the decay of the walls, as well as adversely affect the dwellers in houses so threatened. In 1855 the Houses of Parliament at Westminster began to decay, and various experts were appointed to investigate different means of averting disaster to the legislative chambers. Professor Faraday and Sir Charles Barry were of the number, and after experiments occupying two years they recommended the application of a process suggested by Colonel Szerelmey to "the external masonry of the new palace as a specific against all decay." The Speaker's Court at Westminster still attests the efficacy of the liquid applied, and, as further improvements have since been made in its manufacture, Szerelmey's stone liquid may be regarded as permanently impervious to all damp and atmospheric action. In preserving the Houses of Parliament Messrs. Szerelmey and Co. performed a service to the nation which should not be forgotten, and in their new pamphlet on the "Cause and Cure of Damp and Decay in Masonry" is an interesting recital of the incidents that led to the adoption of their liquid. This gives an enhanced interest to the little *brochure* now in its fifth edition, to which is added a supplement containing information and reports on the corrosion of iron and its remedy.

State of the Brick Trade.

APPARENTLY there is little likelihood of the price of bricks going down for some time to come, and from all centres of the trade come the same reports as to an active demand which, of course, assists in keeping the price of bricks at a high level. In the Midlands it is anticipated that a good demand for common red bricks will continue, and the Stourbridge district is particularly busy in manufactures of firebricks and glazed bricks. One of the leading firms in that locality has on hand an important Government contract for firebricks, and is also busy on a large order for India. Kentish brickfields are well employed—a state of things to which they have become well accustomed—and around London the supply hardly keeps pace with the demand. The enquiries for red bricks keep up in the Metropolitan area, and several brickmakers in the northern suburbs have booked orders for all the red bricks they will be able to produce for several months.

YORK STONE.—The unevenness which has been generally associated with York stone when used as a paving material is, perhaps, the only disparagement which can be urged by surveyors. Hence the necessity for the stone to be all from one district and of a uniform hardness—a thing most difficult to secure. Near Halifax are some seams of stone 70 feet below the surface, and belonging to a lower formation than the average strata of hard York stone. To this the name of the "Silex" brand has been given, the crushing strain of which is 17,106 lbs. per cubic inch, or 1,100 tons per cubic foot. Slabs laid of such a stone should certainly wear evenly, and prove extremely durable.

RYE AND WINCHELSEA.—In the article on these ancient Sussex towns, which appeared in ARCHITECTURE last month, it should have been stated that the pencil sketches of the Church at Rye, and of the interior of the Church at Winchelsea, were by Mr. R. W. Collier, F.R.I.B.A.

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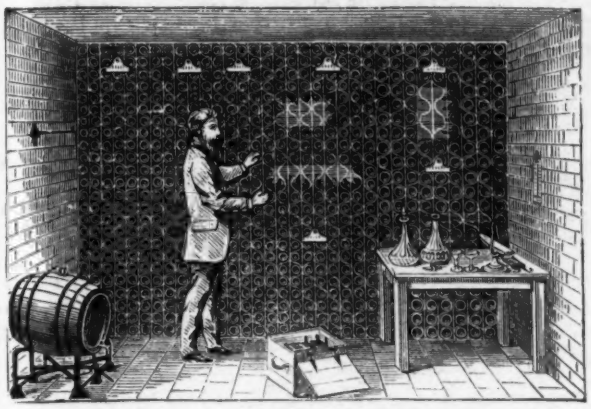

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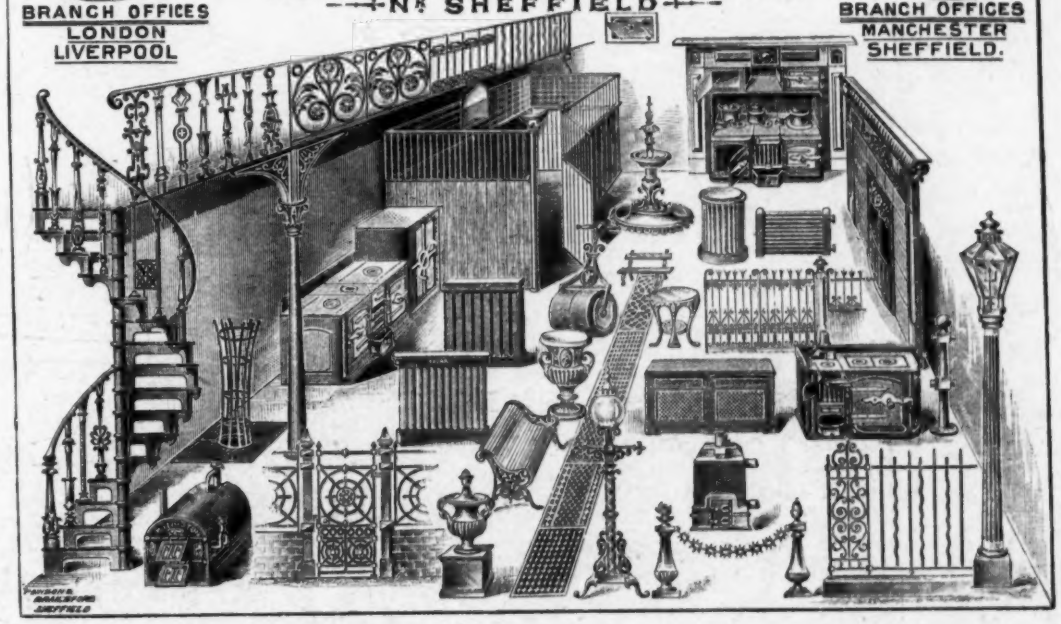

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Stench Traps
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Vases
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Ventilators
Ventilating Grating
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Water Pipes
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